

## **Final Report**

### **Evaluation of Case Management Services Provided by the District of Columbia Department of Health's Childhood Lead Poisoning Prevention Program For Children Identified in Fiscal Year 2002 with Elevated Blood Lead Levels**

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**February 23, 2006**

**Prepared under Subcontract Agreement #633840-005442 with Howard University's Center for Urban Progress in support of its Lead Hazard Technical Studies grant with the U.S. Department of Housing and Urban Development (#DCHBC0001- 03).**

## **Acknowledgements**

**The National Center for Healthy Housing wishes to acknowledge the following for their contributions:**

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- Jonathan Wilson, MPP, Deputy Director
- Patricia L. McLaine, MPH, RN, Project Team Leader
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▪ **Howard University Center for Urban Progress**

- Rodney Green, PhD, Principal Investigator, Lead Technical Studies Grant
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# 1. Introduction

The National Center for Healthy Housing (NCHH) received a subcontract from Howard University's Center for Urban Progress in September 2004 to conduct an evaluation of the case management process for the District of Columbia's (DC) Department of Health's Environmental Health Administration's Childhood Lead Poisoning Prevention efforts.

The purpose of the evaluation was three-fold:

1. An outcome evaluation, based on a review of charts for one complete year of case management work, to determine how policies and procedures compared to the recommendations for case management in the US Centers for Disease Control and Prevention's *Managing Elevated Blood Lead Levels Among Young Children*, Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention, March 2002;
2. A process evaluation, based on a limited number of field visits in 2004, to assess the quality of interactions with families, and consistency with DC protocol regarding documentation of findings, plans for follow-up, coordination, timeliness, and extent to which lead exposures in the home are reduced and children protected; and,
3. Recommendations for the program regarding case management (i.e., case identification, documentation, follow-up, field staff training) and environmental interventions.

Evaluation team staff met with representatives of the DC Department of Health Environmental Health Administration's Childhood Lead Poisoning, Screening and Education Program (CLPSEP) throughout the fall of 2004 to determine what evaluation questions could be most appropriately assessed through available documentation. These included:

1. What does the "typical case" look like?
2. What lead hazards are seen in the "typical" homes of cases?
3. Is the program follow-up timely?
4. What does the typical public health case management effort consist of?
5. What does the "typical" remediation look like?

The evaluation team was not charged to assess the budget or staffing ratios within the program, but acknowledges that both factors have impact on the process.

The evaluation team, in conjunction with the CLPSEP, selected FY 2002 as the focus of the outcome evaluation because it provided the most comprehensive perspective on the case management process, including a large number of inspections, documentation of enforcement actions, and one year of follow-up blood lead levels. The team recognized

that an evaluation based on FY 2002 data might miss improvements in the case management process in subsequent years. However, we felt that the process evaluation/field visits in 2004 would highlight those improvements.

From December 2004 to February 2005, the evaluation team leader, Pat McLaine, conducted a pilot evaluation of 11 cases to finalize the data abstraction process. She also observed three home visits: one to a new case (blood lead 18µg/dL), one to draw repeat blood for a current case and sibling and the third to a family with twins, one with blood lead level (PbB) =10 µg/dL. Despite repeated requests to the Environmental Health Administration's Lead-Based Paint Management Program (LBPMP) officials, she was unable to observe the environmental inspection process associated with these cases, or to participate in additional follow-up visits for children newly identified in 2005 with elevated blood lead levels (EBL).

NCHH provided a report on the pilot to the CLPSEP Director, in late March. Ms. McLaine and Ms. Kawecki discussed the findings with the CLPSEP Director in April 2005.

Data abstraction began in May 2005. A total of 132 cases of EBL children for FY 2002 were included in the final dataset. Team members Pat McLaine and Anne Guthrie Wengrovitz each made six visits in May and June to abstract case management and blood lead testing data. Additional follow-up blood lead data were made available by the CLPSEP in early June. Environmental investigation data associated with these cases were made available by the LBPMP in mid-June. The draft report was discussed with the CLPSEP Program Director in September 2005. This report incorporates the substance of those discussions.

The evaluation presented here thus represents a “snapshot” of the FY 2002 case management process, as reflected in the records provided to the evaluation team. Preliminary evaluation findings will be reviewed by the Childhood Lead Poisoning, Screening and Education Program and the Lead-Based Paint Management Program. The final evaluation report reflects the results of that review.

Both the Childhood Lead Poisoning, Screening and Education Program and the Lead-Based Paint Management Program should be commended for their willingness to open their records to the team's review. Our recommendations are intended to highlight areas where the two programs can improve coordination, as well as where data collection and record keeping in each program may need to improve.

## **2. Methodology**

### **Evaluation Abstraction Process**

The FY 2002 DC childhood lead poisoning prevention responsibilities were divided between 2 divisions: the CLSEP and the LBPMP. Each program had different responsibilities for childhood lead poisoning prevention efforts. Each also had its own record-keeping system.

The CLSEP worked closely with the evaluation team to provide access to paper and electronic records. On the advice of its legal staff, the LBPMP provided an electronic spreadsheet with cases organized by identification number, but not name. It did not provide the team access to its paper records. Limited access to LBPMP data impairs the team's ability to fully assess LBPMP activities.

The team was also not provided access to data systems that may have integrated CLSEP and LBPMP records. This again impairs the team's ability to assess the degree to which both programs coordinated on EBL cases.

The evaluation team identified a total of 132 cases for FY 2002. For a case to be included in this evaluation, it must have:

1. Been assigned to a DC CLPSEP investigator in FY 2002 (October 1, 2001 – September 30-2002). This represents 125 cases; or
2. Had an initial elevated blood lead level (EBLL) greater than 15 µg/dL before the end of September 2002, with evidence that the case file was opened and a referral made to the Lead-Based Paint Management Program (LBPMP) within the first quarter of FY 2003. This represented 7 cases.

The evaluation team used an inclusive definition of a “case” because we did not have access to a single, unified list of cases for this time period. CLPSEP case data were organized according to child's name, not a standard identification number. As noted earlier, the LBPMP provided an electronic spreadsheet with cases organized by identification number, but not name.

To identify the 132 cases, we undertook a number of steps. We obtained a number of lists of cases from the CLPSEP. We compared the names on these lists to the copy of the case logbook for the months of September 2001 through September 2002. In addition, we physically reviewed all the 2002 cases files in the filing room, as well as those for FY 2001 and 2003 in order to address issues of overlap between calendar year and fiscal year and to locate records that may have been mis-filed. From the program's electronic files, we obtained copies of information about cases on the lists that were not in the filing room. When the paper files we reviewed did not include follow-up blood lead data, we obtained electronic blood lead follow-up information for cases where we had located a

file. All data located on a particular case from these combined sources were abstracted onto the Part One forms approved by the CLPSEP (see Appendix 1).

We took additional steps to identify cases on the CLPSEP “case list” and in the 2002 file that were cases from an earlier year; these were excluded from the subsequent analysis. The process of elimination was established during the pilot evaluation described below.

In June 2005, team members were provided access to hard copies of case files in a 3-ring binder with LBPMP environmental inspection data, as well as a copy of a LBPMP spreadsheet with FY 2002 and FY 2003 environmental inspection cases. These data were abstracted onto the Part Two form (see Appendix 1). Whenever possible, the team attempted to match names and addresses in these case files with those for whom Part One CLSEP data were available.

All abstracted data were entered into an ACCESS database; we used SAS version 9.1.2 to generate the descriptive statistics.

Where appropriate, the results of these analyses were compared to the recommended milestones for case management set forth in the US Centers for Disease Control and Prevention’s *Managing Elevated Blood Lead Levels Among Young Children*.

## **Pilot Evaluation Process**

The method for selecting cases, described above, was based on the evaluation team’s experience during the pilot. At that time, eleven cases were selected for review from an alphabetized list of 178 children with elevated blood lead levels ( $\geq 15$   $\mu\text{g}/\text{dL}$ ) for the fiscal year 2002, provided by the DC CLPSEP. Starting with the 7<sup>th</sup> record, every 17<sup>th</sup> record was pulled. Records for individual children were pulled from the public health investigator’s file; DC CLPSEP staff provided additional assistance in locating information from the computer system and from a file of transmissions from the environmental investigation side of the program. Case files were pulled and reviewed during two visits in December 2004 (December 9 and 14). Records were identified at DC CLPSEP for 120 of the 166 remaining children; Ms. McLaine provided DC CLPSEP staff with a list of the names of children for whom no record could be found.

During the February visit (February 17), the CLSEP provided access to a hand written case log for 2002 which appeared to contain the case information for all cases of interest in this evaluation., as well as a computerized log of 69 cases for Fiscal Year 2002 (October 2001 – September 2002).. Environmental cases for 2002 were kept in an LBPMP electronic log, with outcomes indicated, but a copy of this log was not made available to the evaluation team at the time of the pilot. Environmental investigation records were found for three of the six CLPSEP cases and reviewed at this visit.

Two of the 11 pilot cases had been identified as cases in 2001. Five of the 11 cases selected did not become official CLPPP cases but all received at least one home visit by a CLPSEP investigator.

### **Field Visit Methodology**

In December of 2004, Ms. McLaine observed three home visits, one to a new case (blood lead 18µg/dL), one to draw repeat blood for a current case and sibling, and the third to a family with twins, one with blood lead level (PbB) =10 µg/dL. Ms. McLaine observed the caseworker's interaction with the family and consistency in conducting the family interview based on Program guidelines. She also made notes of issues identified in the home visit that needed follow-up, either as required by DC CLPPP guidelines or as recommended in the US Centers for Disease Control and Prevention's *Managing Elevated Blood Lead Levels Among Young Children*. In February 2005, she reviewed the documentation of the case, including the Initial Home Visit (IHV) paperwork and follow-up notes in the file.



### 3. Case Management Data Abstraction Findings

Data abstracted from case records address the following evaluation questions:

1. What does the “typical case” look like?
2. What lead hazards are seen in the “typical” homes of cases?
3. Is the program follow-up timely?
4. What does the typical public health case management effort consist of?
5. What does the “typical” remediation look like?

CDC’s *Managing Elevated Blood Lead Levels Among Young Children* sets recommended guidelines for case management services. The sections of that document that pertain to each evaluation question are included as a basis for assessment of program outcomes.

Percentages are derived from the number of cases for which information was available.

#### 1. What Does a Typical Case Look Like?

The FY 2002 caseload, with data derived from the Initial Home Visit (IHV) questionnaires to which the team had access, illustrates the diversity of the District of Columbia’s population. It should be noted that these data were limited: 22% of the cases did not have a hard copy of the IHV form in their files. Missing data on individual case characteristics, as recorded on the IHV ranged from under 2% to over 34%.

The mean screening Blood Lead Level (BLL) for the 132 cases was 20.77 µg/dL (median = 19.0, SD=6.94, range = 6.0 – 50.00). Two of these cases may have been prior EBL closed by the program and reassigned in FY 2002 based on a new EBL; two other cases had data on BLL drawn before October 1, 2001, but there was no evidence to suggest that a case had been opened before FY 2002 had started.

The mean age at the screening visit was 30.8 months (N=131 cases).

Parents or caregivers identified the child’s ethnicity at the IHV, and could report more than one category. Twelve percent of the case records did not contain ethnicity. Of those with complete data, 83% of the children were of African-American descent; 16% were Hispanic; 3% were Asian, and 2% each were white or a reported combination of ethnicities (i.e., “White Hispanic; Black-Pacific Island).

The majority of identified cases were male (60%).

Of 122 cases where zip code data were available, four zip codes accounted for 57% of the cases: 20001, 20002; 20010, and 20011.

Of 98 cases where data on siblings under age 6 in the home was reported on the IHV, a total of 88 siblings were identified, and the family size was small (40% of the cases reporting 1-2 siblings under age 6). Only 34 of the siblings (39%) were tested for lead poisoning at the time of the IHV.

Parents reported the vast majority (99%) of the cases for which IHV data were available (N=93) were current on their immunizations.

Sixty-nine percent of the cases with IHV data exhibited some type of pica symptom, most commonly that of putting painted articles in the mouth (42%), followed by general hand-to-mouth behavior (38%), putting printed materials in the mouth (28%), putting dirt or soil in the mouth (27%), and putting paint chips or flakes in the mouth (21%)

**Table 1: Demographic and Behavioral Characteristics of FY 2002 EBL Cases  
(N=132)**

<b>Characteristics</b>	<b>Number of Cases for Which Data are Available</b>	<b>Percentage</b>
Race	126	83.% Black 16 Hispanic 3 Asian 2 White 2 Combination
Sex	130	60 % Male 40 % Female
Siblings	98	40% Had siblings  Number of siblings reported per case:  27 % 1 sibling 14 % 2 siblings 3 % 3 siblings 3 % 4 siblings 2 % 5 or more siblings
Siblings tested for lead	57	39% Reported tested
Parent report of child's immunization status	93	99 % Current as to immunizations
Pica behavior	94 children	69 % Reported pica of any type  42% Child reported to put painted articles in mouth 39% Child reported to exhibit hand-to-mouth behavior 28% Child reported to put printed materials in mouth 22% Child reported to put paint chips /flakes in mouth 17% Child reported to put soil/dirt in mouth.

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## 2. What lead hazards are seen in the “typical” homes of cases?

CDC’s 2004 document, *Preventing Lead Exposure in Young Children: A Housing-Based Approach to Primary Prevention of Lead Poisoning*, identifies a program’s ability to portray a clear picture of the risk factors for specific communities, and indeed for specific neighborhoods, as the first step in transforming a secondary prevention effort into a successful primary prevention program.

From *Preventing Lead Exposure in Young Children: A Housing-Based Approach to Primary Prevention of Lead Poisoning*, pp. 25-26.

1. Identify high-risk areas, populations, and activities associated with housing-based lead exposure by
  - a. Using surveillance, demographic, and housing data to identify high risk geographic areas and to quantify progress in reducing childhood lead exposure and producing lead-safe housing units;
  - b. Using enhanced targeting strategies and information systems initially developed to improve lead screening for children to direct attention and expand resources to reduce lead hazards in high-risk housing, especially that occupied by at-risk families (i.e., low income with infants and/or expectant parents);
  - c. Identifying high-risk families who could benefit from immediate assessment and services to reduce their lead exposure risk. One efficient way of identifying and reaching such families is through existing programs that already have established relationships with communities or families at high risk for lead exposure (e.g., Healthy Start [HS], Early Head Start [EHS], Special Supplemental Nutrition Program for Women, Infants and Children [WIC]), community health centers and managed Medicaid programs. Federal and state Medicaid agencies can consider incorporating lead exposure prevention services into newborn home-visiting requirements for high-risk populations and in high-risk areas....;
  - d. Identifying individual families that may be living in dwellings with lead hazards. CLPPPs should use all tools at their disposal (e.g., elevated BLL case mapping, and environmental inspection and code violation reports) to identify families residing in dwellings with a high probability of having lead hazards. For example, families should receive priority attention if they live in a unit next to one in which a child with elevated BLLs has been identified; and
  - e. Giving high priority to identification and remediation of housing where multiple cases of childhood lead poisoning have been identified.

FY 2002 data on risk factors were less complete than on demographic characteristics. Missing data in the IHV questionnaires on individual risk factors for FY 2002 cases ranges from 28% to 44%. CLPSEP files contained paper copies of only 13 LBPMP environmental inspection reports. The LBPMP spreadsheet contained information on 69

cases opened in FY 2002, fewer than the 132 case identified as receiving CLSEP services. Missing data can have implications for the ability of the CLSEP to conduct targeted screening and outreach and for the LBPMP to target inspections and enforcement.

### **IHV Data on Risk Factors**

Seventy-one percent of the cases with complete IHV data lived at their current address for one year or less. Although the majority (59%) of these cases lived in rental housing, it is important to note that 41% lived in owner-occupied units, and the majority (59%) lived in single-family units.

Twelve percent of those cases for which IHV data were available reported they lived in public housing or Section 8 units. Fifty-seven percent of EBL cases for which IHV data were available were reported to have been exposed to deteriorated interior paint; 49% were exposed to deteriorated exterior paint. For those children living in multi-family units, 60% reported exposure to deteriorated paint in the common area hallway or stairs. (Evaluation team members note that the coding of the latter question was difficult to follow and the 60% may be an over-estimate). Visible dust was observed in 53% of the cases.

Recent renovation or paint removal was reported in 39% of the cases with complete IHV data; 18% reported possible parental occupational exposure to lead, especially among construction workers and painters. Twenty-five percent of the cases with complete IHV data came from families or neighborhoods with a history of lead poisoning, and 19% lived in neighborhoods located within a mile of an industrial hazard.

**Table 2. Risk Factors as Reported at Initial Home Visit (N=132)**

<b>Characteristics</b>	<b>Number of Cases for Which Data are Available</b>	<b>Percentage</b>	
Housing Ownership	93	59 %	Renters
		41 %	Owners
Type of housing in which child resides	76	53 %	Single family home
		36 %	Apartments
		12 %	Public Housing/Section 8
Months living in the house	74	18 %	3 months or less
		9 %	4-6 months
		31 %	7-12 months
		35 %	14-45 months
Location of deteriorated paint	95 (interior)	57 %	Interior
	93 (exterior)	49 %	Exterior
	58 (multi-family common area)	60 %	Multi-family common area
Recent renovation or paint removal	92	39 %	Reported redecoration or paint removal
Possible parental occupational exposure to lead	88	18 %	Possible exposure (7 construction workers, 2 painters, 1 auto worker, 1 not specified)
Visible dust in unit	92	55 %	Dust observed
Industrial hazards within 1 mile of dwelling	88	19 %	Located within 1 mile
History of lead poisoning in family or neighborhood	87	25 %	History of family or neighborhood lead poisoning

## **LBPMP Data on Risk Factors**

The evaluation team had access to 69 case records with some type of environmental inspection data (electronic, paper copy, or both). Of these records, 32 could be matched with data from the CLPSEP IHV and follow-up blood lead testing records. Very few of the CLPSEP files (N= 13) contained copies of the inspection reports.

The majority of the 13 EBL cases with completed inspection reports in the files (70%) lived in homes built before 1940. (See Table 3). On average, fewer than 40 surfaces were tested via X-ray Fluorescence technology. The majority of exterior surfaces tested were positive for lead-based paint, with a mean of 4.9 lead-based paint hazards identified per case. Slightly less than a majority (49.7%) of the interior surfaces tested were positive for lead-based paint, with a mean of 19.6 hazards identified.

Dust wipe testing of floor and window sills in the 13 units indicated that the vast majority of tested surfaces were below federal hazard standards (40 ug/sq. ft. for floors; 250 ug/sq. ft. for window sills).

Although exposure to lead in soil and in water are important risk factors, the environmental inspection data made available to the evaluation team identified no cases where tests were conducted on water samples, and only 2 cases where tests were conducted on soil.

LBPMP spreadsheet data for 59 of 69 cases for which data were complete on inspections indicate that 35 (59%) were positive for lead, 3 (5%) were negative, and the rest of the units (36%) were not tested due to difficulties in gaining access to the unit.

One of the units inspected appeared to have been the dwelling of two EBL children in the FY 2002 CLPSEP caseload.

It was not possible for the evaluation team to determine from the available records whether LBPMP inspectors also evaluated the other homes where an EBL case spent significant time.

**Table 3. Lead-Based Paint Hazards Identified in Environmental Inspection Reports**

Characteristic	N	Mean or Percentage
Age of house inspected	13	69% Pre-1940 23% 1940-1960 8% Built after 1960
Number of surfaces tested with XRF	11	Mean = 36 SD = 23.5
Percentage of exterior surfaces with LBP	11	Mean = 69.6% SD = 27
Number of Exterior LBP hazards identified	7	Mean = 4.9 SD = 3.5
Percentage of interior surfaces with LBP	9	Mean = 49.7% SD = 34.7
Number of interior LBP hazards identified	8	Mean = 19.6 SD = 19.5
Percentage of floors tested that met federal clearance standards	13	Mean = 80.6% SD = 28.8
Percentage of window sills tested that met federal clearance standards	13	Mean = 82.1% SD = 31.5



### **3. Is the program follow-up timely?**

To assess whether program follow-up was timely, the evaluation team examined several questions:

1. Were confirmatory venous samples obtained according to the recommended CDC screening guidelines?
2. Were cases opened in the time frames established in CDC's 2002 case management guidelines?
3. Did home visits occur within the time frames established in CDC's 2002 case management guidelines?
4. Did environmental investigations occur within the time frames specified in the CDC's 2002 case management guidelines?

The FY 2002 CLSEP protocol for follow-up was as follows:

## Interpretation of Blood Lead Test Results and Follow-up Activities: Class of Child Based on Blood Lead Concentration

Venous Blood Lead Level	Action required
(Class I) 1- 9 µg/dL	<ul style="list-style-type: none"> <li>Continue testing annually until 72 months.</li> <li>Mail lead test result to the physician</li> <li>Provide anticipatory guidance; education to reduce blood lead, lead exposure and decrease lead absorption.</li> </ul>
(Class II) 10-19 µg/dL	<ul style="list-style-type: none"> <li>Follow-up blood test within 2 months</li> <li>Mail lead test result to the physician</li> <li>Provide anticipatory guidance</li> <li>Place child under case management that includes a complete history of nutritional assessment and refer to Lead Based Paint Program for environmental investigation</li> </ul>
(Class III) 20-44 µg/dL	<ul style="list-style-type: none"> <li>Follow-up blood test within 1 week</li> <li>Mail lead test result to the physician</li> <li>Provide anticipatory guidance</li> <li>Place child under case management that includes a complete history of nutritional assessment and refer to Lead Based Paint Program for environmental investigation</li> </ul>
(Class IV) 45-69 µg/dL (Class V) 70 µg/dL or greater	<ul style="list-style-type: none"> <li>Follow-up blood test within 24 hours</li> <li>Mail lead test result to the physician</li> <li>Notify physician immediately</li> <li>Instruct parent/legal guardian to send child to the hospital immediately</li> <li>Place child under case management to includes a complete history of nutritional assessment and refer child to Lead Based Paint Program DHCD, and DCRA for environmental investigation/lead abatement or/and alternative housing for environmental investigation</li> </ul>

It is important to note that the CDC guidelines were published in March of 2002, i.e., mid- FY 2002. It is unlikely that any childhood lead poisoning prevention program in the nation would have met all of these recommended timeframes in FY 2002. In fact, in 2003 CDC sponsored nine trainings for program and case managers to ensure dissemination and implementation of guidelines. DC's CLPSEP representatives attended the pilot of that training in May 2003 and received further training in 2005. .

Hence, it is not realistic to expect the DC protocol to fully reflect the CDC recommendations. In the context of evaluating the DC CLPSEP's FY 2002 case management services, the 2002 CDC recommendations serve at best as a means to begin to benchmark progress.

## Time from BLL Screen to Venous Confirmation

The 2002 CDC recommendations incorporate CDC's 1997 guidelines for confirmatory blood lead tests are as follows:

From *Managing Elevated Blood Lead Levels Among Young Children*, pp. 51

**Table 3.3. Recommended Schedule for Obtaining a Confirmatory Venous Sample**

Screening test result ( $\mu\text{g}/\text{dL}$ )	Perform a confirmation test within:
10-19	3 months
20-44	1 week-1 month <sup>a</sup>
45-59	48 hours
60-69	24 hours
> 70	Immediately as an emergency lab test

<sup>a</sup>The higher the BLL on the screening test, the more urgent the need for confirmatory testing.

Table adapted from: *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials*.  
Atlanta: CDC; 1997.

As noted earlier, we believe that four of the cases in our dataset may have been prior EBL cases that were re-opened. . Based on discussions with the DC CLSEP, we have chosen to exclude those cases from the analysis. Note also that CDC recommends that two confirmatory blood lead levels, three months apart, be performed on cases with BLL in the 15-19  $\mu\text{g}/\text{dL}$  range. The evaluation team could not determine from the records whether the CLPSEP practice in FY 2002 was to wait for a second confirmatory venous sample before assigning cases in the EBL 15-19  $\mu\text{g}/\text{dL}$  range to CLPSEP investigators. For the purposes of this evaluation, all blood lead tests conducted after the first confirmatory test are treated as follow-up blood tests.

For 115 FY 2002 cases with complete data, a mean of 52.8 days elapsed between initial BLL and the confirmatory BLL (SD = 72.3). Seventeen cases did not have evidence of confirmatory samples. Table 4 indicates that mean time elapsed between the screening and confirmatory samples exceeded CDC recommendations for BLL between 20-24  $\mu\text{g}/\text{dL}$  and over 44  $\mu\text{g}/\text{dL}$  between 10-14  $\mu\text{g}/\text{dL}$  and 15-19  $\mu\text{g}/\text{dL}$ .

**Table 4. Mean Days between Blood Lead Level Screen and Confirmatory Venous Sample, by Category of Confirmatory BLL**

Confirmed BLL	CDC Recommendations	N	Mean Days	SD	Range
10-14	3 months	22	61.1	64.4	8-291
15-19	3 months	21	45.8	52.7	0-199
20-24	1 week – 1 month	18	39.2	43.5	6-158
25-44	1 week-1 month	14	26.4	23.0	4-76
Over 44	Immediately – 48 hours	4	28.8	22.6	9-60

## Environmental Inspections

The 2002 CDC case management guidelines recommend that environmental inspections occur between 24 hours and 7 days of a confirmed EBL over 20 µg/dL, depending on the confirmation sample result

From *Managing Elevated Blood Lead Levels Among Young Children* Recommendations, p. 36:

**Time Frames for Environmental Investigation and Other Case Management Activities According to a Child's Blood Lead Level<sup>a</sup>**

Blood lead level µg/dL <sup>b</sup>	Actions	Time frame for beginning intervention
10-14	Provide caregiver lead education. Provide follow-up testing. Refer the child for social services if necessary.	Within 30 days
15-19	Above actions, plus: If BLLs persist (i.e., 2 venous BLLs in this range at least 3 months apart) or increase, proceed according to actions for BLLs 20-44.	Within 2 weeks
20-44	Above actions, plus: Provide coordination of care (case management). Provide clinical evaluation and care. <sup>c</sup> Provide environmental investigation and control current lead hazards.	Within 1 week
45-70	Above actions.	Within 48 hours
70 or higher	Above actions, plus hospitalize child for chelation therapy immediately.	Within 24 hours

As noted earlier, the evaluation team was able to match EBL data to hard copies of environmental inspection reports for only a few of the cases. For 22 cases where confirmed EBLs can be matched to LBPMP data, the mean time elapsed between the confirmed sample and the environmental inspection was 46.7 days (SD = 39.2). For those cases with a confirmed EBL over 20, environmental inspections appeared to occur later than the CDC recommended time frames.

**Table 7. Mean Days between Confirmatory Blood Lead Level and Environmental Inspection, by Category of Confirmatory BLL**

Confirmed BLL	CDC Recommendations	N	Mean	SD	Range
10-14	Within 30 days	2	28.0	18.4	15- 41
15-19	Within 2 weeks	6	32.8	43.6	-21-+89
20-24	Within 1 week	5	53.6	42.7	7 -113
25-44	Within 1 week	4	50.0	36.4	24- 104
Over 44	Within 24-48 hours	1	20.0		

The limited LBPMP data accessible to the evaluation team offer several explanations for the delays. First, environmental inspectors may not have had access to the home. Data on how many phone calls it took to schedule the environmental visit were available only on one case (2 calls and 2 visits). For 59 cases recorded in the LBPMP spreadsheet, inspectors gained entry to the unit for testing purposes in 38 cases (64%); of 29 cases that could be matched to CLPSEP data, they reported gaining entry in 23 (79%). Reasons reported for failure to conduct environmental inspections included access denied, the unit was vacant, the wrong address was provided to the LBPMP, or the case had been relocated. Second, there may have been a delay in referrals from the CLPSEP to the LBPMP. LBPMP spreadsheet data indicate that a mean of 34 days elapsed between the date a case was referred to LBPMP and the date of the environmental inspection (N=58 cases); for 29 cases where spreadsheet data can be matched to CLPSEP records, the mean number of days elapsed is 41.1

#### 4. What does the typical public health case management effort consist of?

CDC's 2002 recommendations state that case management involves intensive follow-up with the child and the family to ensure that BLL are reduced below 15 µg/dL for a sustained period of time, lead hazards are reduced in the home, and appropriate coordination and referral of the child to medical, developmental and other social services has occurred before cases are closed. A minimum of two home visits, and an individualized written plan of care for the child are key components of the case management process.

##### *Managing Elevated Blood Lead Levels Among Young Children Recommendations, pp 4, 5, 7 :*

Case management of children with EBLLs involves coordinating, providing, and overseeing the services required to reduce their BLLs below the level of concern (i.e., 10 µg/dL). It is based on the efforts of an organized team that includes the child's caregivers. A hallmark of effective case management is ongoing communication with the caregivers and other service providers, and a cooperative approach to solving any problems that may arise during efforts to decrease the child's BLL and eliminate lead hazards in the child's environment. Case management is not simply referring a child to other service providers, contacting caregivers by telephone, or other minimal activities.

The current model of case management has eight components: client identification and outreach; individual assessment and diagnosis; service planning and resource identification; the linking of clients to needed services; service implementation and coordination; the monitoring of service delivery; advocacy; and evaluation (3). Once an eligible child is identified, the case manager should do the following:

- Visit the child's residence (and other sites where the child spends significant amounts of time) a minimum of two times.
- Assess factors that may impact the child's BLL (including sources of lead, nutrition, access to services, family interaction, and caregiver understanding).
- Oversee the activities of the case management team.
- Develop a written plan for intervention.
- Coordinate the implementation of the plan. Evaluate compliance with the plan and the success of the plan.

An environmental inspector should also visit the child's residence, with the case manager if possible, to conduct a thorough investigation of the site and identify sources of environmental lead exposure. The case management team can then use the results of this investigation to develop a plan to protect the child and correct hazardous conditions. Although environmental services may be provided by the case manager, the environmental inspector, or other program staff, the case manager is responsible for ensuring that a child receives services in a timely fashion....

##### *The Case Management Plan*

The case manager is responsible for developing and implementing a written management plan based on a needs assessment done at visits to the child's home and other sites where the child spends significant amounts of time. Although all cases require a minimum of two home visits, additional visits are often necessary. The caregivers also should be involved in developing the plan to ensure that it is realistic and meets their perceived needs. ...

There were no copies in any of the FY2002 CLSEP case files reviewed of a written, individualized plan of care for the child. Thirty case files contained a consent form signed by the parents at the time of the Initial Home Visit that gave the program permission to initial case management services. No individualized written plan of care accompanied the files. IHV records indicated that information about home maintenance, cleaning, nutrition, and blood lead follow-up was provided at the time of the visit.

The files did not contain information on referrals to nutritional, developmental, social service, or housing programs that specialized in lead hazard control. (It should be noted that the District of Columbia did not have a US Department of Housing and Urban Development Lead Hazard Control Grant during FY 2002, but has one now.) Records of referrals may have been stored in other records not available to the team.

Field visit data (summarized in a later section) indicate that the CLSEP paper record of case management activities underestimates that number of contacts between the CLPSEP staff and families. This suggests that the FY 2002 data, as provided to the evaluation team, may not provide a complete perspective on the case management process.

CLPSEP data contained 3 case records where an EBL child was chelated. In two of the cases, there is evidence the child's chelation occurred in the hospital, but there are no data on the length of stay, or whether the family was relocated from the house. LBPMP inspection records indicated that Notices of Defect were sent to the landlord in one of these cases. The LBPMP provided no data on whether this case was closed or that remediation of the lead hazards occurred. The parent in a second case requested that the case be closed by the CLPSEP in 2005 because the child was under regular medical follow-up. The records made available to the evaluation team contained no data on the outcomes of the third case.

## Follow-up Blood Lead Levels

CDC 2002 case management guidelines call for follow-up blood lead levels until the child's BLLs are reduced below 15 µg/dL and stay at that level for six months.

From *Managing Elevated Blood Lead Levels Among Young Children*, pp. 51:

**Table 3.4. Schedule for Follow-Up Blood Lead Testing<sup>a</sup>**

<b>Venous blood lead level (µg/dL)</b>	<b>Early follow-up (first 2-4 tests after identification)</b>	<b>Late follow-up (after BLL begins to decline)</b>
10-14	3 months <sup>b</sup>	6-9 months
15-19	1-3 months <sup>b</sup>	3-6 months
20-24	1-3 months <sup>b</sup>	1-3 months
25-44	2 weeks-1 month	1 month
> 45	As soon as possible	Chelation with subsequent follow-up

<sup>a</sup>Seasonal variation of BLLs exists and may be more apparent in colder climate areas. Greater exposure in the summer months may necessitate more frequent follow ups.

Seventy-two cases had evidence of a follow-up BLL, 58 cases had a second follow-up, and 29 cases have evidence of at least three follow-up BLLs. The mean confirmatory BLL for the 72 cases with one follow-up was 18.8 ug/dL. A mean number of 107.8.- days elapsed between the confirmatory venous sample and the first follow-up BLL, with a mean BLL of 14.1 ug/dL at the first follow-up. This constitutes a 25% reduction in BLL. The mean confirmatory BLL for cases with two follow-up tests was 19.7 ug/dL. A mean of 254.3 days elapsed from confirmatory sample to the second follow-up sample for these cases, with a mean BLL of 14.2 at second follow-up, or a 28% reduction in mean.

The delays are not consistent with the CLSEP's own protocol for follow-up testing. Using the 2002 CDC case management recommendations as a benchmark, the follow-up of EBL FY 2002 cases was consistent with the recommendations for first BLL follow-up for the 20-24 ug/dL range (Table 8). Second follow-up BLL occurred within the recommended time frames for EBLs between 10-14 ug/dL and 15-19 ug/dL (Table 9).



**Table 8. Mean Days between Confirmatory Blood Lead Level and First Follow-up Blood Lead Test, by Category of Confirmatory BLL**

Confirmed BLL	CDC Recommendations of Early Follow- Up Test	N	Mean	SD	Range
10-14	3 Months	13	154.7	137.9	1 - 419
15-19	1-3 Months	15	132.5	150.6	-82- +443 *
20-24	1-3 months	15	37.3	144.8	-461 - +126*
25-44	2 weeks – 1 month	11	97.4	105.3	13 - 324
Over 44	As soon as possible	2	15.5	0.7	15-16

\*Note: Negative values in the ranges are most likely the result of inclusion of the 4 cases where there were questions about the start of their case management services.

**Table 9. Mean Days between Confirmatory Blood Lead Level and Second Follow-up Blood Lead Test, by Category of Confirmatory BLL**

Confirmed BLL	CDC Recommendations for Later Follow-Up Tests (after 1 <sup>st</sup> Follow-up)	N	Mean	SD	Range
10-14	6-9 Months	9	207.3	144.4	58 - 571
15-19	3-6 Months	10	242.2	107.3	84- 447
20-24	1-3 months	13	264.8	255.1	106-1096
25-44	1 month	9	235.4	177.9	47-587
Over 44	Chelation with subsequent follow-up	2	124.	124.5	36 - 212

## Case Closure

CDC 2002 case management guidelines recommend case closure either for administrative purposes (when the program can clearly document it had attempted and was unable to reach the client) or because EBL levels were reduced and lead hazards were addressed.

*Managing Elevated Blood Lead Levels Among Young Children Recommendations, p.7:*

*Case Closure*

It often takes an extended period of time to complete all the elements in a case management plan. When the environmental lead hazards have been eliminated, the child's BLL has declined to below 15 µg/dL for at least 6 months, and other objectives of the plan have been achieved, the case should be closed. However, the case manager should discuss with the PCP and caregiver provisions for appropriate long-term developmental follow-up. (See Chapter 5, "Developmental Assessment and Interventions".) Case closure criteria should also include provisions for administrative closeout if at least three documented attempts to locate or gain access to the child and caregiver have failed.

CLPSEP data show a total of 24 of the 132 cases (18%) closed. Forty-two percent of those cases were closed in FY 2002; 46% in FY 2003; 8% in FY 2004, and 4% in FY 2005. Of these 24 cases, 18 (75%) were closed for administrative reasons. The files made available to the team contain no documentation of how many attempts were made to reach the cases before the cases were closed.

The LBPMP spreadsheet has completed data on the status of 46 of 69 FY 2002 cases, of which 23 (50%) were closed by the end of FY 2003. Thirty-five of 59 cases (59%) were reported to be positive for lead; 3 were reported to be negative. Notices of Defect were sent to Landlords in a total of 26 cases. The mean time elapsed between inspection and Notice of Defect was 18 days. Only 3 cases had evidence that the units were re-inspected. Three cases had evidence that a Certificate of Compliance was sent to parents. One case had a Certificate of Compliance sent to the landlord.

## **5. Observations based on the FY 2002 data.**

### **Data Quality**

Data quality affects a program's ability to assess performance. Appendix 2 provides examples of the data abstraction difficulties encountered from the FY 2002 CLSEP records made available to the evaluation team. Among the most common problems were:

1. Incomplete documentation on the Initial Home Visit (IHV) Questionnaire, especially regarding referrals to other programs (i.e., WIC, Head Start, etc.)
2. Inaccuracies in spelling of first or last names, improperly recorded date of birth, and other factors that lead to duplication of case records or difficulties in abstracting information from electronic records.
3. Paper files not in proper alphabetical order.
4. Records missing from paper files.
5. Errors or inconsistencies in data entry for electronic records.
6. Incomplete documentation of environmental inspection results for cases where paper records could be examined.
7. Follow-up blood lead data not included in paper case record, and difficulties in matching names and addresses on follow-up blood lead records.

CLSEP staff report that some of these data quality issues have been addressed as part of its post-FY 2002 efforts to develop an integrated on-line system. However, each of these record-keeping issues could be the subject of on-going staff training and monitoring.

The evaluation team's limited access to LBPMP data does not allow us to evaluate the quality of the data. However, the fact that access to the data was so restricted significantly impairs the team's ability to identify cases where lead hazards were successfully remediated.

Of greatest concern is the percentage of missing data from individual case records. We acknowledge that the CLSEP and LBPMP may have additional data that were not disclosed to the evaluation team. However, 22% of the cases reviewed did not have a hard copy of the IHV questionnaire in the files, and missing data on individual items in the questionnaire ranged from 2% to 44%. Only 13 of the CLSEP files had physical copies of the environmental inspection reports. Missing data and lack of coordination of data between both programs has implications for the CLSEP's and LBPMP's ability to target outreach and intervention.

### **The "Typical Case" and Environmental Risk Factors**

The FY 2002 IHV data are important in "painting the picture" of the typical case and risk factors, and thus in improving primary and secondary prevention efforts.

Based on the data provided, the DC program is to be commended for the high percentage of children who are current on their immunizations.

Two areas in FY 2002 may have merited further attention: 1) screening of siblings and 2) identification of risk factors in the child's home.

The data as abstracted suggests that fewer than 40% of the siblings under age 6 had blood lead testing at the time of the IHV. Since these children are at high risk, it was important for the CLSEP to determine whether these children were tested, and to establish clear plans for follow-up testing. The team did not see evidence of these plans in the records to which they had access. Moreover, the evaluation team had reservations about whether the information on siblings was recorded completely on the paper records. This is an example of an area where missing data on the IHV may affect the targeting of screening and prevention efforts.

The IHV data also suggested opportunities in FY 2002 for outreach and referral to other programs to address identified hazards.

Lead hazards in public housing are one such example. Twelve percent of FY 2002 cases for which IHV data were available reported they lived in public housing or Section 8 units. Because these units should have been hazard-free in 2001-2002 under Federal law, the incidence of children becoming sick in these units is of concern. Of further concern, evaluation team members noted that the IHV reports had the option for caseworkers to check more than one answer to this category, but that the reports rarely recorded more than one category. If this was the case, the number of EBL cases in public or Section 8 housing in FY 2002 may have been underestimated. The records available to the team did not contain evidence these cases were referred for special enforcement to achieve compliance with the federal Lead Safe Housing Rule (24 CFR Part 35).

Other examples of opportunities for targeted outreach and intervention emerge from the IHV data on reported home renovations and family employment in construction. Over 40% of the FY 2002 cases occurred in owner-occupied units. Thirty-nine percent of cases reported recent home-remodeling/paint removal. Twenty-five percent came from families or neighborhoods with a history of lead poisoning. Eighteen percent reported possible parental occupational exposure to lead. Renovation-related exposure thus appeared to be a factor that could have triggered additional case management follow-up. The records accessible to the team did not indicate that this occurred. This also suggests that the CLSEP and LBPMP have an opportunity to expand primary prevention activities by sponsoring lead-safe work practice training for homeowners and construction workers.

Only 13 case CLSEP case files contained copies of the LBPMP inspection reports. While there may have been other mechanisms for coordinating CLSEP and LBPMP data

on risk factors to which the team lacked access, the small number of inspection reports in CLSEP files was disturbing. Case managers who need to communicate with caregivers and primary care providers need to know the specifics of where hazards were identified.

### **Case Management and Environmental Inspection of Identified Cases**

The FY 2002 CLPSEP and LBPMP data supplied to the evaluation team suggest that this is an area where both programs needed to significantly intensify their efforts

Because access to data were restricted by both programs, it is possible that both case management follow up and lead hazard remediation occurred more frequently than our records show. However, the data supplied to the team indicates that the CLSEP program did not conduct follow-up blood lead tests and did not initiate services at the time frames recommended by the CDC in 2002, and sometimes failed to meet its own protocol targets. The follow-up BLLs do, however, indicate that the children receiving case management services did experience a drop in BLL during the period of case management.

It was not possible to determine from the records whether referrals to other programs occurred per CLSEP protocol. It was also not possible to determine if the program provided more intensive caregiver education and follow-up than the record showed.

The LBPMP 's inspection data indicate that only three cases were closed because lead hazards were addressed. Because of the limited data provided to the team, we could not determine whether the LBPMP vigorously pursued enforcement actions concerning landlords who received Notices of Defect.

Effective case management requires that both blood lead levels are reduced and lead hazards are eliminated before cases are closed. The District's Childhood Lead Poisoning Prevention Program as a whole could not demonstrate this coordinated approach in FY 2002.

## 4. Field Visit Findings

The CLPSEP provided the evaluation team with its current case management protocols prior to the 2004 home visits. In some important respects, these are more ambitious than the CDC 2002 case management guidelines, with home visits for all cases above 10 µg/dL, confirmatory blood samples at the IHV, and cases closed when BLL are sustained below 10 µg/dL. Case closure criteria differ from CDC guidelines in the length of follow up testing and the procedures for administrative closure. There appears to be no separate criteria to ensure that lead hazards have been addressed before the case is closed. The protocols are as follows:

<b>Interpretation of Blood Lead Test Results and Follow-up Services According to Diagnostic Criteria</b>	
<b>Venous Blood Lead Level</b>	<b>Action required</b>
(Class I) < 9 µg/dL	No action required. Continue testing annual until 72 months. Provide anticipatory guidance; education to reduce blood lead exposure and decrease lead absorption.
(Class IIA) 10-14 µg/dL	Assign to Outreach Investigators for IHV questionnaire review, visual environmental inspection, confirmatory blood lead test (CBLT), and education within 1 week. Prior to IHV notify parents and PCP. If (CBLT) is 10 µg/dL and above, place child under individual case management. Refer case to Dept. of Housing for environmental inspection of home.
(Class III) 20-44 µg/dL	In addition to above, refer child to the Pediatrician for a full physical, developmental and neurological evaluation and medical follow-up.
(Class IV) 45-69 µg/dL	This is an emergency. Refer to the Pediatrician for immediate (CBLT) and possible admission into the Hospital. Following environmental inspection, coordinate with the Dept. of Housing and other social service agencies for temporary alternate housing. Continue with case management.
(Class V) > 709 µg/dL	This is an emergency. Notify physician immediately. Send child for emergency admission into the Hospital for prompt initiation of medical management to include chelation therapy. Continue with case management.

## **In home visit (IHV)**

Done by CLPSEP outreach Investigator who completes IHV questionnaire, that covers a full history which includes family, current and past medical, immunization, nutritional especially pica, environmental, social, cultural, and occupational. Visual environmental inspection in the home is done, blood specimen is obtained for a confirmatory test, and written consent is obtained from the parent or guardian. Good housekeeping practices is discussed to curtail lead exposure. Methods of reducing lead hazards are explained pending environmental inspection. Importance of good nutrition is emphasized. Educational material on lead poisoning, its source, prevention, and services offered by other agencies is supplied. A full report of the IHV is written and with this request is made for environmental and home inspection.

## **Case Closure**

Children are discontinued from case management according to the following categories:

- Medical Discharge
- Administrative Discharge

### **Medical Discharge**

In medical discharge two consecutive lead blood level test has remained less than 10 micrograms per deciliter (<10µg/dL) for at least two (2) follow-up tests. The lead hazard that caused or are likely to have caused the child's elevated lead blood level has been abated, and there is no new exposure to lead hazards.

### **Administrative Discharge**

Administrative Discharge occurs when:

- A child is delinquent for follow-up blood test in excess of six months following scheduled appointment date, and is unable to be located by CLPSEP staff and or Healthcare Provider.
- A child attains his/her 7<sup>th</sup> birthday while under case management, the blood lead level may still be 15 µg/dL and above but not in excess of 30 µg/dL or the level requiring chelation therapy, the child is referred to his/her pediatrician or the family physician or healthcare provider for continued medical management if required.
- A child has relocated to another State or another Country.

In both types of discharge a memo is written containing the case summary, reason and date of closure.

Appendix 4 provides a detailed summary on all three Initial Home Visits observed in 2004. In all three cases, the investigator appeared to follow protocol for IHV, and documented in the record the attempts to schedule them. At the IHV itself, consents for case management follow-up were obtained from the parent or guardian, and a confirmatory blood draw was attempted. In two cases, this was successfully completed; in the third, the family agreed to follow-up with the primary care provider later that week at a scheduled visit. For the latter, program investigator's notes indicate that she followed-up to assure that the testing had occurred. Ms. McLaine's observations indicate that the confirmatory blood draws were conducted in a highly professional manner with little stress to the child.

The investigators conducted a thorough visual inspection of the property as part of the IHV, answered parent's questions, and provided education materials as per protocol. Ms. McLaine also noted that all the investigators did a good job of establishing rapport with the clients. IHV observations were documented appropriately on the IHV form.

Follow-up to the IHV visits, however, did not appear to fully conform to the CLPSEP protocol or to 2002 CDC case management guidelines.

At Ms. McLaine's February 2005 review of the records for these cases, there was no evidence of an individualized plan of care for the child. In each IHV, the parent/caregiver had raised specific questions about how the child could have been exposed, or about ways to reduce exposure. These questions could have been the basis for an individualized plan of care, or for referrals to other programs. The records available to Ms. McLaine in February did not indicate this had occurred.

Follow-up telephone contacts between the investigator and the EBL families appear to have occurred in a number of cases, but the documentation was not systematic. It was not possible to determine if more than one home visit occurred. It appears that the CLPSEP has a more intensive case management effort underway than its records suggest. Failure to fully document these efforts affects the program's ability to expand resources or staff. This is particularly important in light of the 2002 CDC recommendation that a minimum of 2 home visits occur as part of case management.

Ms. McLaine was not able to inspect records concerning referral to the LBPMP or subsequent environmental investigation reports, and thus could not determine whether environmental inspections occurred according to protocol. She also was not able to determine whether deteriorated paint observed at one IHV was reported to the landlord.

Follow-up with primary care providers was documented in only one of the three visits. Referrals to other social service agencies, and most especially plans for follow-up developmental assessment, were not documented in the records reviewed.



Case closure was also difficult to follow from the available records. One of the children was going to move from District to Virginia the month after the IHV. Although the parent provided a Virginia address to the program, the February 2005 inspection of records did not reveal either a referral to a Virginia program or documentation of closure.

## **5. Recommendations**

To achieve the national goal of elimination of childhood lead poisoning by 2010, all communities must re-examine their case management processes. 2004 CDC guidelines for primary prevention encourage CLPPP programs to identify and treat units with a history of multiple lead poisonings, and to more effectively integrate their screening, environmental inspection, and enforcement efforts. Such activities require resources, well-trained staff, and a climate of interagency cooperation.

The DC CLPSEP is to be commended for setting ambitious case management standards of performance. Its current effort to provide confirmatory venous BLL testing in the context of Initial Home Visits is a unique feature of the program, and can serve as a model for the country. This evaluation suggests a number of other strategies to improve the process.

### **Recommendations Concerning Data Collection, Documentation, and Quality Control**

#### **1. Continue to improve the method of identifying cases for tracking purposes**

FY 2002 case data were stored in a variety of lists, logbooks, paper copies, and electronic records. The data, as provided to the evaluation team, were not integrated into a single system that enabled the team users to track progress on individual cases. Records kept in a variety of formats did not lend themselves to setting or tracking individual case milestones (i.e., length of time between initial EBL and confirmatory, etc.). This also could impair case closure, and can leave many children on the case management list long after their situations have been resolved.

The CLSEP and LBPMP staff in 2005 indicated that they have made significant efforts in coordinating data collection and integrating data into a unified electronic system. They also indicate that they are placing high priority on tracking new EBL cases above 20 ug/dL. This is to be commended.

To ensure the highest quality of case management services, both Programs need to maintain an on-going effort to ensure high quality data entry and documentation for all activities, from the IHV through subsequent follow-up visits and referrals. The Field visits conducted in 2004-2005 indicate that documentation of follow up activities needed to be more systematic. This is easily corrected with additional staff training.

Follow-up activities need to be systematically tracked, not only because they provide important evidence on scope of the case management activity, but also because they help to support future increases in resources.

## **Recommendations Concerning Priorities for Case Management Services**

### **1. Identify addresses of units where multiple EBL cases have occurred and increase enforcement efforts immediately.**

CDC placed new emphasis in 2004 on targeting and remediating deteriorated housing units associated with multiple lead poisonings. The number of new cases in FY 2002 (N=132) suggests that the CLPSEP and LBPMP caseload is small enough to undertake this effort. Recognizing that staff resources for both programs are limited, the programs might consider working with students/interns from a local university partner to develop this master list.

Once such a list is developed, the programs must aggressively refer these cases to the appropriate District of Columbia offices for enforcement. The FY 2002 data available to the evaluation team did not contain information on the District of Columbia enforcement process once Notices of Defect were sent to landlords. We did not have access to enough case records to examine the process in 2004 and 2005. However, it is vital that both the CLSEP and the LBPMP follow these enforcement efforts closely in order to achieve the national goal of eliminating childhood lead poisoning by 2010.

### **2. Intensify efforts to communicate with families, through home visits, phone contacts, and provision of an individualized plan of care for the EBL child.**

2002 CDC guidelines emphasize that case management is an on-going process that requires multiple contacts with the family, organized around a plan of care unique to the family. As noted earlier, the CLSEP program may need to examine its documentation of follow up activities. If the program does not have the resources to engage in additional face-to-face contacts, this may be an area to target in future budgetary requests.

### **3. Intensify efforts to assure that lead hazards are remediated before cases are closed.**

A very small percentage of the FY 2002 cases had evidence that hazards were addressed by the end of FY 2003. None of the 2004-2005 field visit cases had evidence that the hazards were addressed. At a minimum, cases that the program closes for non-administrative purposes should document what actions were taken to address the hazards, as well as how BLLs declined. This may require changes in the program's record-keeping process. It also requires closer cooperation between the CLPSEP and LBPMP. The DC Department of Health's Environmental Health Administration's decision to

separate the CLPSEP and the LBPMP functions into different offices makes this coordination difficult, but not impossible.

The program may wish to consider dust lead testing at the IHV as a way to triage units for more intensive follow-up.

It should also consider additional follow-up for cases involving exposure through remodeling/ renovation. Exposures for the “typical” DC case may be changing. Since a number of the FY 2002 cases involved remodeling, or possible exposure through parent’s occupation, it is important that the CLPSEP consider ways to support on-going efforts in Lead Safe Work Practices Training, including offering such training on site or in community public health settings.

**4. Intensify coordination and referrals on medical management, developmental assessment, and nutritional and social services. Document these contacts.**

CDC 2002 guidelines emphasize that case management requires intensive coordination with a variety of other services to attend the EBL child’s and the family’s needs. The FY 2002 records suggest that this effort was poorly documented. The 2004-2005 field visits did not show evidence of improved documentation of communications. The CLSEP program may need to consider whether it should formalize and track follow-up communications with other parties. CDC’s 2002 recommendations indicate that primary care providers should be informed of the IHV results and written plan of care. The primary care provider should also be informed when closing case out for public health purposes, and arrangements should be made for follow-up developmental testing. The CLSEP may wish to consider changes in its protocols for EBLs greater than 20 ug/dL to set formal benchmarks for the communication with the different entities who provide services to an identified EBL child.

**Recommendations Concerning Ongoing Program Evaluation**

The evaluation team had access to incomplete data for FY2002, and very few opportunities to observe changes or improvements in case management practices in 2004.

Since the program has made efforts to improve case management services since FY 2002, it is important for it to determine whether it currently has more success in meeting CDC’s 2002 guidelines.

The evaluation team, therefore, recommends that the program perform an internal audit of a sample of FY 2004 cases, structured along the lines of this review, to determine whether the data quality control or the timeliness of services to EBL cases with BLL greater than 20 µg/dL has improved.



## Appendix 1 – Data Abstraction Form

### DC CLPPP Case Review – Part 1

EBL02- \_\_\_\_\_ / \_\_\_\_ / \_\_\_\_

1. Case #

2. Last Name

3. First Name

4. DOB

5. Race

MM/ DD /YYYY

6. Sex:

7. Address

8. Zip

9. # Months

10. Address if <12 mos

11. Zip

M=male

@ this address

F=female

12. Copy of Initial visit form in the file (Y=yes, N=no): \_\_\_\_\_

13. Investigator # \_\_\_\_\_  
(code “999” if not in file)

14. Date case assigned \_\_\_\_/\_\_\_\_/\_\_\_\_\_  
MM/ DD / YYYY

15. Date of first visit attempt (MM/DD/YYYY)	16. # Phone calls prior to completion of IHV	17. # HV attempts prior to completed IHV	18. Date of Successful IHV (MM/DD/YYYY)	19. IHV: Time in home (# hours). If unknown, code 99	20 Total # visits by Investigator
____/____/____			____/____/____		
21. Renter (Y/N)	22. Single family=SF, Apt=A, Public Hsg & Sec 8 = P	23. Deter. interior paint (Y/N)	24. Deter. exterior paint (Y/N)	25. If multi: halls & stairs deter. (Y/N) (Code Z if single family home)	26. Recently redecorate or remove old paint? (Y/N)
27. Parent with occup. Exposure?	28. Visible Dust? (Y/N)	29. Ind. Hazards	30. Immunizations current?	31. History of LP in	32. Pica: painted

(Y/N) If Y, specify:		w/in one mile Y/N	(Y/N)	family or neighbor- hood (Y/N)	articles (Y/N)
33.Pica: fallen paint flakes or chips (Y/N)	34.Pica: printed materials (Y/N)	35.Pica: soil or dirt (Y/N)	36.Pica: finger/thumb (Y/N)	37. Any Pica? (Y/N)	

#### Initial Sibling Testing

38. Number siblings under 6 living in this home (Use "0" if none) : \_\_\_\_\_

39. Number of these children tested (Use "0" if none): \_\_\_\_\_

40. Date(s) of sib testing: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

41. Number of siblings with BLL  $\geq$  10 $\mu$ g/dL ELEVATED (use "0" if none): \_\_\_\_\_

42. Number of siblings with BLL  $\geq$  15 $\mu$ g/dL NEW CASES (use "0" if none): \_\_\_\_\_

43. Signed consent in file (circle one): YES NO [If NO, sign visit form? Yes No]

44. IF YES, date of consent \_\_\_\_\_

#### 45. Case Blood Lead Testing Information

Type of Test	Date	Result $\mu$ g/dL	Type V/C/U	Lab	CLPPP Staff: Yes No Unknown	Notes
Initial draw						
Confirmatory						
Follow-up						
Follow-up						
Follow-up						
Follow-up						
Follow-up						
Follow-up						

Type: V=venous, C=capillary, U=unknown

46. Chelated (circle one): YES NO UNKNOWN

NOTE: use unknown only if BLL is  $\geq 40$ ; otherwise, use NO

47. If Yes, child hospitalized (circle one): YES  
NO

48. If Yes, # days in hospital: \_\_\_\_\_

Referred to:

49. WIC Program (circle one): YES NO

50. Healthy Start Program: YES NO

51. Other child/parent educational program: YES NO

52. Developmental Assessment: YES NO

53. If YES,

name: \_\_\_\_\_

Date Case Closed (MM/DD/YYYY)	Type of closure	Date of Letter to child's PCP (MM/DD/YYYY)	Notes:		
____/____/____		____/____/____			
Name of data abstractor (print)	Date data abstracted MM / DD / YYYY		Data Entry Name (print)		Date data entry MM / DD / YYYY
	____/____/____				____/____/____



## DC CLPPP Case Review – Part 2

EBL02-

1. Case # \_\_\_\_\_ 2. Last Name \_\_\_\_\_ 3. First Name \_\_\_\_\_ 4. Env. Case # \_\_\_\_\_

7. Address \_\_\_\_\_ 8. Zip \_\_\_\_\_ 9. Ward \_\_\_\_\_

Environmental Health Follow-up

10. Date Initial Contact by Environmental Inspector MM/DD/YYYY	11. # Phone attempts prior to EI	12. # of Inspector visits prior to complete EI	13. Date of Successful Environ. Inspection MM/DD/YYYY	14. Date of Notice of Defect letter to <b>parent</b> MM/DD/YYYY	15. Date of Notice of Defect letter <b>landlord</b> MM/DD/YY
/ /			/ /	/ /	/ /
16. Total # visits by Inspector(s)	17. Date of Environmental Remediation MM/DD/YYYY	18. Was extension requested? (Y/N) and Date: MM/DD/YYYY	19. Letter of Work Completion Date: MM/DD/YYYY	20. Date clearance (dust & visual) MM/DD/YYYY (If >1 date, give last date)	
	/ /	/ /	/ /	/ /	
22. Date of Certificate of Compliance sent to <b>parent</b> MM/DD/YYYY	23. Date of Certificate of Compliance sent to <b>landlord</b> MM/DD/YYYY	24. Date Case Closed by Environmental MM/DD/YYYY	25. Type of closure: A=admin. H=haz. control complete. U=unknown		
/ /	/ /	/ /			

## Environmental Investigation

26. # Bedrooms	27. Type Housing Unit	28. Date of Construction YYYY	29. Exterior Type	30. 2 <sup>nd</sup> Exterior type	31. # Surfaces Tested XRF	32.# ext. surfaces with LBP	33. # exterior LBP hazards
						/	
34. # interior surfaces with LBP	35. # interior LBP hazards	36.Dust failure locations	37. Dust failure levels	39. # floors pass/total floors tested	40. # sills pass/total sills tested	42.Building Conditions (Frm 5.1): # positive findings	42.Floor Plan (Y/N)
/		1. 2. 3. 4. 5.	1. 2. 3. 4. 5.	/	/		
43.Soil Tested? (Y/N)	44.Water tested? (Y/N)	45. Other observations (e.g. toothmarks)	46. On-going renovation? (Y/N)	47. Photos taken for file (Y/N)			

## Remediation

48. Summary of actions taken as part of remediation (include ST interventions)
--

49. Referred to DCA for Legal enforcement (Y/N)	50. HUD Program Yes/No	51. Other DC Program (Y/N) (Name if yes)	52. NGO Program (Y/N) (Name if yes)	53. Cost of remediation	54. Who paid for remediation?
55. Relocation? Y/N/U					

Referrals and additional work (check if applicable)

Section 8 program (circle one): Yes No

Public Housing Authority (circle one): Yes No

Name of data abstractor (print)	Date data abstracted MM / DD / YYYY	Data Entry Name (print)	Date data entry MM / DD / YYYY
	/ /		/ /

**Appendix 2 –  
Examples of Quality Control Issues  
Identified During Data Abstraction - July 5 2005**

Cases identified by initials only. Full names can be provided on request.

**1. CLPPP PBBs not all in the system.**

- RB 10/31/99
- CG 12/20/93 – 1/24/02, 2/6/02 both CLPPP

**2. New EBL found (wrong child) during look-up**

- AJ, different DOB

**3. Case memo field not routinely filled out.**

- EK – initial EBL not in computer record

**4. Some of CLPPP follow-up PbBs were not marked as CLPPP in electronic records**

**5. 5 tests in paper record were not in electronic file**

- Family L

**6. Homes in poor condition were not routinely referred.**

**7. Follow-up blood lead draws not in database.**

- LO – follow-up blood lead drawn by CLPPP 8/20/02 – results not in electronic database
- DC CLPPP may have done many more venous blood lead tests but test results were not in file and electronic filing system records the doctor's name, not CLPPP program (input and filing problem)
- S, De Q – blood drawn 12/17/02 on IHV – no record in file or electronic system.
- DS – initial PbB 25 in 9/2002; 3/17/04, spiked to 68 – was hospitalized and chelated on 9/03. Homeowner. House was inspected but no enforcement (1 year later, child got very ill).

**8. Hyphenated names in database and files in different ways – problem with organization**

- Family V – 3 sibs, BLLs = 16, 25, 20. No IHV – note in family that family could not be located. Nothing on electronics. Nothing about contacting PMD. Electronic files – nothing for 1 sib – Jose, but was listed in hard copy (no DOB though). No investigation even though a previous address was ID and current address was only 1 month.

**9. Shelters in DC** – at least 2 were inspected (400 W Street NW #12 20011 and 1417 Belmont #404, 20009). In very poor condition. One was not inspected because family had moved out. Area that needs further investigation by the program.

**10. Risk designation on electronic report has no designation to findings from IHV** (Says “low risk” when in fact risk may be very high)

**11. ”No sib” designation in database appears to be wrong or not consistently filled out.**

- SW 8/17/99 – CLPPP result from IHV not in file 11/20/01
- WS – good example – very dilapidated home, peeling chipping paint and dust. 4 sibs less than 6. No follow-up BLLs draw. 3 of 4 sibs tested, All >15. Environmental inspection resulted in certificate of compliance, but family had moved out and house was vacant. Family lost to follow-up.
- WS, electronic database has wrong date for confirmatory BLL (says 24 – should be 45).

**Appendix 3**  
**Pilot Evaluation for DCCLPPP**  
Prepared by Pat McLaine, RN, MPH  
National Center for Healthy Housing

**Selection of Cases for Pilot**

Eleven (11) cases were selected for review from an alphabetized list of 178 children with elevated blood lead levels ( $\geq 15\mu\text{g}/\text{dl}$ ) for the calendar year 2002, provided by the DCCLPPP; starting with the 7<sup>th</sup> record, every 17<sup>th</sup> record was pulled. Records for individual children were pulled from the public health investigator's file; DCCLPPP staff provided additional assistance in locating information from the computer system and from a file of transmissions from the environmental investigation side of the program. Case files were pulled and reviewed during two visits in December 2004 (December 9 and 14). Records were identified at DCCLPPP for 120 of the 166 remaining children and a list with the names of children for whom no record could be found was provided to DCCLPPP staff.

During my February visit (February 17), a hand written case log for 2002 was identified, which appears to contain the case information for all cases of interest in this evaluation. A computerized log of 69 cases for Fiscal Year 2002 (October 2001 – September 2002) was also identified. Environmental cases for 2002 are kept in an electronic log, with outcomes indicated, but a copy of this log was not made available to me. Environmental investigation records were found for three of the six CLPPP cases and reviewed at this visit.

Two of the 11 pilot cases had been identified as cases in 2001. Five of the 11 cases selected did not become official CLPPP cases but all received at least one home visit by a CLPPP investigator.

**Timeliness of Health Investigator Visits**

CLPPP staff made at least one visit to the home of all eleven cases selected for this pilot. One of the eleven cases was visited more than 180 days after initial EBL and is considered an outlier; these measures of timeliness of health investigator visits are calculated on the other ten cases:

Time period	Mean (days)	Median (days)	Range (days)	Standard Deviation (days)
Blood lead test to Home Visit	26	27	13-44	9
Blood lead test to HD Report	17	16	5-26	6
HD Report to Home Visit	9	8	3-27	4

### **Age and Race**

The eleven children in the pilot ranged from nine (9) to 70 months, with an average age of 34 months, median age of 38 months and standard deviation of 18 months. Race was unknown for one child, who the program was unable to locate. Of the ten children successfully visited by the program, seven (7) were African American, two (2) were Hispanic and one (1) was Asian.

### **Case Management Services**

Parents or guardians of two of the eleven pilot cases refused services and one case was unable to be located. Out of the remaining eight cases, signed consents were in the file for six cases and a parent or guardian of all eight cases signed HD forms as the historian. Services included:

Testing of siblings (where present): 75%

Testing of case child: 87.5%

Immunization Check: one case was behind on immunizations; 87.5% (N=7) up to date.

### **Risk Factors**

Based on the Initial Home Visit Questionnaire, the following information was ascertained from the review of eight pilot cases where information was collected:

Factor	Risk
Type of housing	75% single family housing 25% multi-family housing
Occupancy	75% owner-occupied 25% rental
Cracked peeling exterior paint	50% of units
Cracked peeling interior paint	50% of units
Obvious dust	87.5% of units
History of recent renovation	50% of units
Parent occupation	62.5% of cases: fathers of three children were painters
Known history of lead poisoning – family or neighborhood	25% of cases
Pica behavior	87.5% of cases: 50% painted articles, 12.5% paint flakes or chips; 25% printed materials; 25% soil or dirt; 62.5% finger/thumb sucking

One child was adopted from China, a country known to have significant environmental lead pollution. One family was very concerned about lead in water; a neighbor had tested their tap water tested privately and found the levels to be 15 times above the EPA standard for first draw and 6 times above standard after a 3-5 minute flush. A letter with information about the neighbor's testing was faxed to DCCLPPP and in the record but there was no information about what the program did with the information. The letter notes that DC government is no longer testing water for free. The environmental record indicated that the inspector had recommended that the parents run the tap water prior to drinking.

In another case, a grandmother's house in Maryland was identified as a likely source of poisoning but the file contained no information about a referral to Maryland CLPPP for follow-up.

### **Blood Lead Follow-up**

The goals of case management are to eliminate environmental lead hazards, ensure the child's blood lead level (BLL) has declined below 15ug/dL for at least 6 months and to achieve other objectives of the plan developed for the case child.<sup>1</sup> Of the six official cases in this pilot, three cases had BLLs below 15ug/dL for at least six months. In three other cases, the case child had one blood lead level below 15ug/dL, insufficient to close out but



indicative of a change in BLL. One child was not re-tested; the remaining five children all had declines in BLLs.

### **Timeliness of Environmental Visits**

Of the six official cases, documentation of environmental visits was found for three cases; for a 4<sup>th</sup> case, a note was found in the file indicating that a visit had been attempted but there was no response and the case had been closed for environmental follow-up. No information was available for two cases, with blood leads of 17 and 40ug/dL. Time to environmental visit varied widely among these four cases:

Measure	Average (days)	Median (days)	Range (days)	Std. Deviation (days)
Time from blood test to Environmental Inspection	77	73	35-129	44
Time from HD notice to Environmental Inspection	65	68	19-107	44
Time from Initial HV to Environmental Inspection	58	63	9-103	47

Average age for the three houses inspected was 1927. Inspectors did dust testing in two of the three cases, a total of 4 wipes per house. In the third house where entry was made, the inspector did not take any dust samples and did not test any interior components with the XRF because the unit showed signs of renovation. Since children in this home were probably at extremely high risk, it is unclear why environmental testing was not done.

When XRF was used, very few surfaces were tested. In one house, 20 surfaces were tested, 6 exterior (4 positive) and 14 interior (2 positive); in the second home, only three exterior components were tested, all positive (and very high). The quantity of XRF testing does not appear to conform with testing recommended in the HUD Guidelines. Although there was a family garden in one property, the inspector did not take a soil sample. No water samples were tested and no information about risk of elevated lead in water was found in any of the environmental records even though neighbors of one of the parents had private testing done and had identified very elevated lead in water levels.

### **Notice of Violation**

In two of the three cases inspected, notices of violation were issued, one was issued 17 days later and one was issued on the same day as the scheduled inspection. Notices were sent to the owner and the family.

## Compliance

For one case, a certificate of compliance was issued 7.5 months after the inspection and notice of violation. The record did not contain any information about relocation of residents during abatement or documented efforts to reduce environmental hazards prior to abatement. From the records available, it appears that abatement included the following: wet/scrape, stabilize paint on windows, doors, baseboards, apron, casing, ceiling; wrap exterior window trim; make floors cleanable. However, room-by-room specifications for the work were not available. For the second case, the file indicated that a certified letter was sent 3 months after environmental inspection, but no copy of the letter was in the file and no other follow-up information was available.

## Case Close out

I was unable to determine from the files of the six official cases whether or when the case was closed out. Information was available for the five cases that were closed administratively by the DCCLPP because they did not meet criteria for follow-up:

# of families	Details on follow-up of closed cases
1	Family moved out of state and could not be found.
2	Second blood lead, done by CLPPP, was below 15.
1	Second blood lead, done by primary care provider, was below 15. Initial was capillary.
1	Parent refused services stating the primary care provider advised her that blood lead elevation was probably related to capillary draw and told her not to be concerned about lead test result because previous venous blood lead tests (taken 18 months prior) were low. No indication in record that this child was retested after date of EBL.

## Next Steps

Based on this pilot, the evaluation of 2002 cases seems very do-able. However, I will need to have the following:

1. Accurate case list for 2002. This is the basis for my review. The paper list that I have is missing June, July and December.
2. Access to all case management records, including:
  - a. Initial investigation records and case management notes
  - b. Environmental investigation records, including reports and dates of outcomes. Access to the electronic files would be most helpful.
  - c. Any other files that contain information on cases managed in 2002.
  - d. Any information on case closure
3. I will also need to make at least two visits with an environmental inspector who is conducting the initial property inspection for lead.

4. Copy of paperwork from home visits in December that I went on.

I will modify the form for gathering information based upon our discussion of the pilot results. I look forward to a full discussion of the pilot findings with you.

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<sup>1</sup> Managing Elevated Blood Lead Levels Among Young Children, Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention, March 2002, CDC, page 7.

## **Appendix 4 Report on Home Visits**

Pat McLaine  
National Center for Healthy Housing

Observations were made of three home visits, one to a new case (blood lead 18µg/dL), one to draw repeat blood for a current case and sibling and the third to family with twins, one with blood lead level (PbB) =10 µg/dL. Names of staff are redacted.

### **New Case December 9, 2004.**

4 phone calls were made to set up a visit; all were documented on Initial Home Visit (IHV) paperwork. The IHV indicated that child's blood lead level was 18µg/dL. The visit lasted 1 hour and 10 minutes. Signed consent was obtained. A good explanation of the program was provided and the family was given program materials. REDACTED NAME conducted a visual inspection of the very small basement apartment in a private home, which revealed some paint chips in back storage room and some chipping paint in the front entrance, outside the unit. A bookcase had peeling paint. A painted area near the radiator in the bathroom had some chipping. Dust was also observed in some of window wells, but over-all the unit was in good condition. The child has been in US for three months (previously lived in Morocco); father is a graduate student. REDACTED NAME looked at toys and discussed hand-to-mouth behavior with the mother. Hobby information was asked at end of visit. REDACTED NAME attempted to take a venous follow-up specimen (left arm), but was unable to obtain blood. The family indicated that they had an appointment with their doctor on December 10, 2004 and would obtain a follow-up blood lead test. Father indicated some concern about lead in tap water. Family will be moving to Virginia in January 2005 and provided the program with their new address and contact information.

REDACTED NAME had a very nice manner with the family. She provided basic information about lead poisoning and gave mother instructions on how to get tap water tested, if family wanted to pursue this. She gave family instructions to clean-up chipping area near front entrance, to vacuum the back storage room and closet, to remove painted bookcase to storage room, to clean window areas and area near radiator and box area, and to get the child's blood re-tested at medical follow-up visit tomorrow. Information was written accurately on the IHV sheet. Record indicates that the program will refer the family to Virginia CLPPP, but no documentation of referral was in the report. Follow-up notes indicated that REDACTED NAME two follow-up phone conversations on December 13<sup>th</sup> with both mother and father. The child had been seen on 12/1/04 for other tests (which were normal), but had not yet been re-tested for lead. Child's PMD suggested that parents get child some iron.

Recommendations: Overall, visit was conducted well and documentation includes phone calls needed to set up appointment and following up the visit. Although investigator had a plan, this was not written down in the record or for the client. It would be easy to prepare a written plan, either at the visit or immediately after returning to the office, which would be in keeping with current CDC recommendations. Plan for this family might include the following:

1. Clean paint chips from front exterior area
2. Clean back room and closet – vacuum
3. Clean window areas and area near radiator and box
4. Move painted bookcase to back storage room
5. Have child re-tested at medical follow-up visit tomorrow

Another visit would be needed to check up on cleaning in the home environment.

Would also be good to ask parents how they thought child got exposed, since this wasn't obvious from the visit.

Case could be closed, following parent's move to Virginia and referral to Virginia program for follow-up (no confirmation PbB). No notation in record I reviewed regarding either closure or a final referral. REDACTED NAME indicated that a follow-up blood lead test in March 2005 was 10µg/dL.

#### **Blood lead retesting – follow-up visit - December 9, 2004**

Second visit was made to home of two children with elevated blood lead levels, one with history of elevated capillary (PbB = 18µg/dL), confirmed at 8µg/dL venous on September 27<sup>th</sup> by DC program staff. This visit was a 3 month follow-up. Family is Argentinian, highly educated, very high income, and has lived in a beautiful home near the park for five years, with a long history of remodeling work. Recently, a new tile floor and repainting was completed in the playroom. In the last 6 months, the family hired a contractor to re-do all the windows in this old house; paint was burned, scraped and dust was everywhere in the house, even though the workmen took precautions to contain the dust, pursuant to Mother's concern about risk to the children. Mother indicated that when the work was done, dust was everywhere and she couldn't ever keep it clean. When the kitchen was re-done, family put plastic over the doorway. The house is old with beautiful old woodwork, doors and windows. A housekeeper wet cleans the home very frequently.

Child's 3 year-old sibling had a 13µg/dL capillary, confirmed at 10µg/dL venous on September 27<sup>th</sup>, also by DC program staff. After obtaining written consent to draw blood, REDACTED NAME completed the two venous draws in about ten minutes; neither child cried and mother and grandmother were very pleased.

Family expressed concern about vitamins from Costco: Lil Critters Gummy Vites, Northwest Natural Products, Inc. Lot 14649, Exp. 05/06. REDACTED NAME indicated program would follow-up. Family expressed concern about whether there would be any long-term problems for the children; REDACTED NAME indicated that there would not be any long-term problems if levels went down quickly.

Visit took one hour and five minutes (including walkthrough of house, for my benefit, not needed for the blood draw) but blood draw took less than 10 minutes. Mother was very appreciative of assistance.

No notes were made of the visit and the only indication that anything was done was indication in the CLPPP database that follow-up blood was drawn on December 9<sup>th</sup>. Not clear what follow-up plan is for this child other than repeating blood lead levels. It would appear that the primary source of lead for this case was the remodeling, which is continuing, despite the mother's knowledge about lead and attempt to minimize exposures. Review of blood leads indicates that 5 year old had one elevated capillary (18µg/dL), confirmed as 8µg/dL, and down to 6µg/dL during this visit. 3 year old child has had elevated capillary tests since 12 month visit in October 2002 and blood lead for this visit was 8µg/dL. I was unable to review the IHV report for this case.

Recommendations: Venous follow-up, as conducted by the DC program, is excellent and I would recommend this type of re-testing to any program. REDACTED NAME did an excellent job: the draws were done quickly, easily, without pain to child, and with full support of family. However, there is no good record of the visit in the file and no indication of any of the concerns raised by the parent. Better written records are necessary to improve tracking and document effort. It is unclear what the plan is for this family, other than follow-up blood lead levels. Family appears to be at minimal risk, based on regular professional cleaning of the home and current appearance. However, family has continued to renovate the home. Based on my visual observations, it appears that the elevations were related to home improvement remodeling work in the home conducted by private firm. This could certainly be followed up in a number of different ways by DC Government. In terms of Mother's concern regarding long-term problems, it appears from the blood lead history that Investigator's answer was OK, however, this mother would probably benefit from additional resources, such as professional literature. The bottom line for some children with EBL is that we can't predict what the outcome will be. It is unclear if the concern about vitamins from Costco was followed up. Could consider close-out of these cases after two BLLs less than 10µg/dL. Parent and physician should be provided with summary of blood lead test results.

#### **Elevated BLL Follow-up - December 14, 2005**

This visit was made with Investigator REDACTED NAME to 23-month old twins, one with elevated blood lead level. Informed consent was obtained and educational materials were provided to the family. REDACTED NAME did a nice job with the interview,

following the IHV questionnaire. I did not hear him ask if children spend time with another relative; this was marked as N/A on IHV. REDACTED NAME did a very nice of venipuncture for L.; obtained blood on second attempt on left arm. Complete visit, including visual walk-through took about 90 minutes. Venipuncture took 10 minutes. REDACTED NAME did not re-test Lindsey and 4-year old sibling because they had been tested on 11/04. IHV was completed satisfactorily and accurately, according to my notes.

REDACTED NAME has a nice, calm, pleasant and relaxed manner. He was very respectful of the family, took a very systematic approach. Assessment of the home was thorough and he verbally highlighted positive areas to parents. Walkthrough did detect some small areas of peeling, chipping paint and dust. Most windows were replaced, most floors hardwood. Kitchen had patched areas on walls, ceiling was cracked. Cracks in bathroom, hallways, ceiling and one wall in children's bedroom. Some peeling paint was observed on the gray porch, white fascia board above porch, and front door.

However, plan for follow-up was not clear. IHV reports that defects will be taken up with landlord, but no documentation of this was found in the record I reviewed. Because the blood leads are less than 10, unclear whether program will follow-up, even though this could be viewed a primary prevention case. REDACTED NAME told Mom that program would notify her of results and would follow-up child in 90 days. REDACTED NAME indicated that if child's BLL was elevated, environmental lead section would come out and test the walls.

Recommendation: Need to have written plan for the family and follow-up to make sure that something is done about identified hazards, even if children have BLLs below 10µg/dL. Based on my observation, plan would include:

1. Reduce dust levels in home where children play and where dust observed – wet cleaning
2. Identify peeling, chipping paint areas for family and landlord.
3. Follow-up peeling, chipping areas with landlord.
4. Inform mom about blood lead results and plan for next draw
5. Communicate with children's PCP.

No documentation beyond the IHV questionnaire. No documentation of any follow-up effort made. Program may want to consider criteria for primary prevention cases: why they would follow, when they would close.

### **Environmental Inspection Visits**

Although we made numerous requests to accompany an environmental investigation/inspection visit, the Department refused to schedule a visit on which we could accompany the inspector. Consequently, we cannot comment on the adequacy of the environmental investigation documentation or the extent to which this portion of the

case management work is carried out in accordance with CDC recommendations. However, the lack of good communication between the SLPP staff conducting the IHV and the environmental inspector is evident and this appears to be having a detrimental effect on the program's ability to carry out case management.